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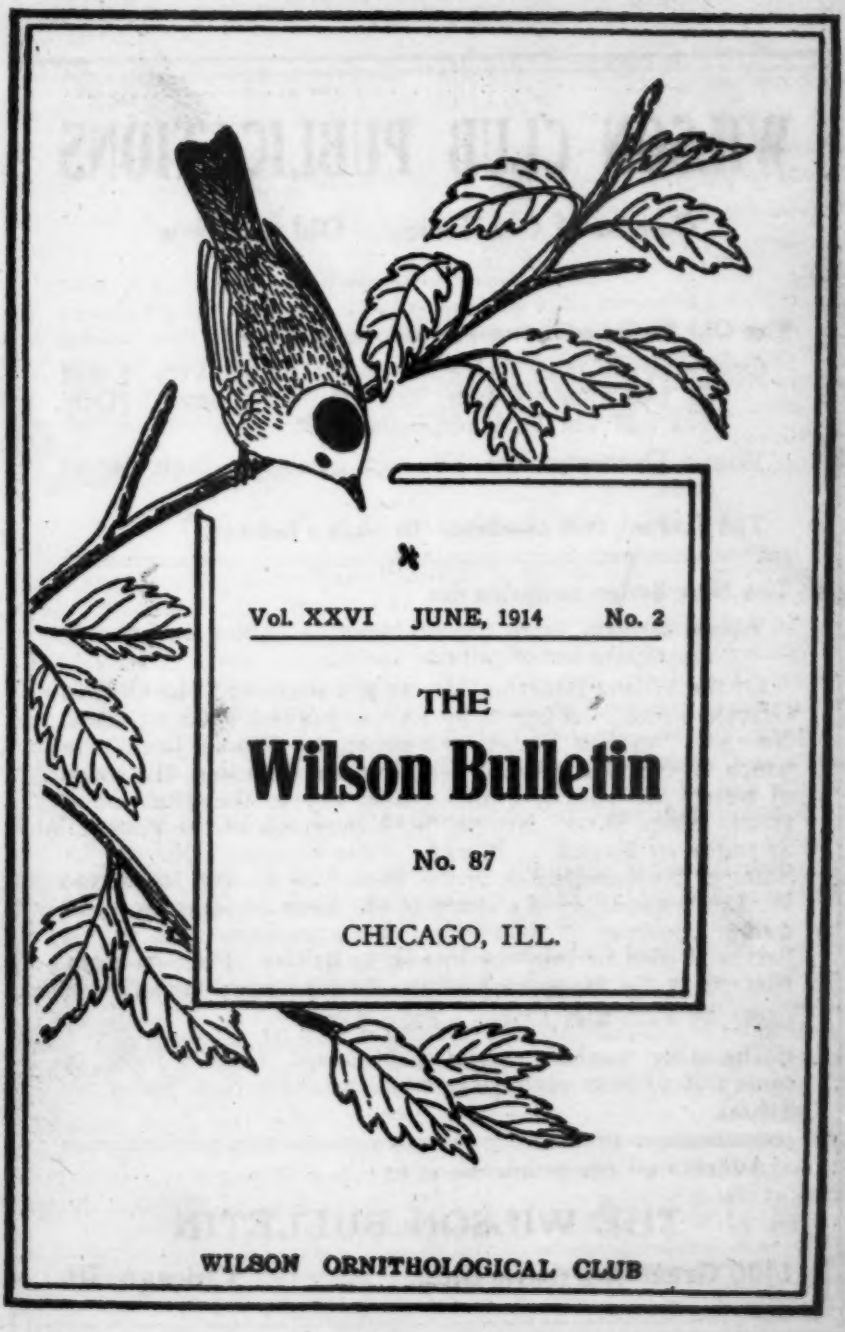

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THE

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No. 87

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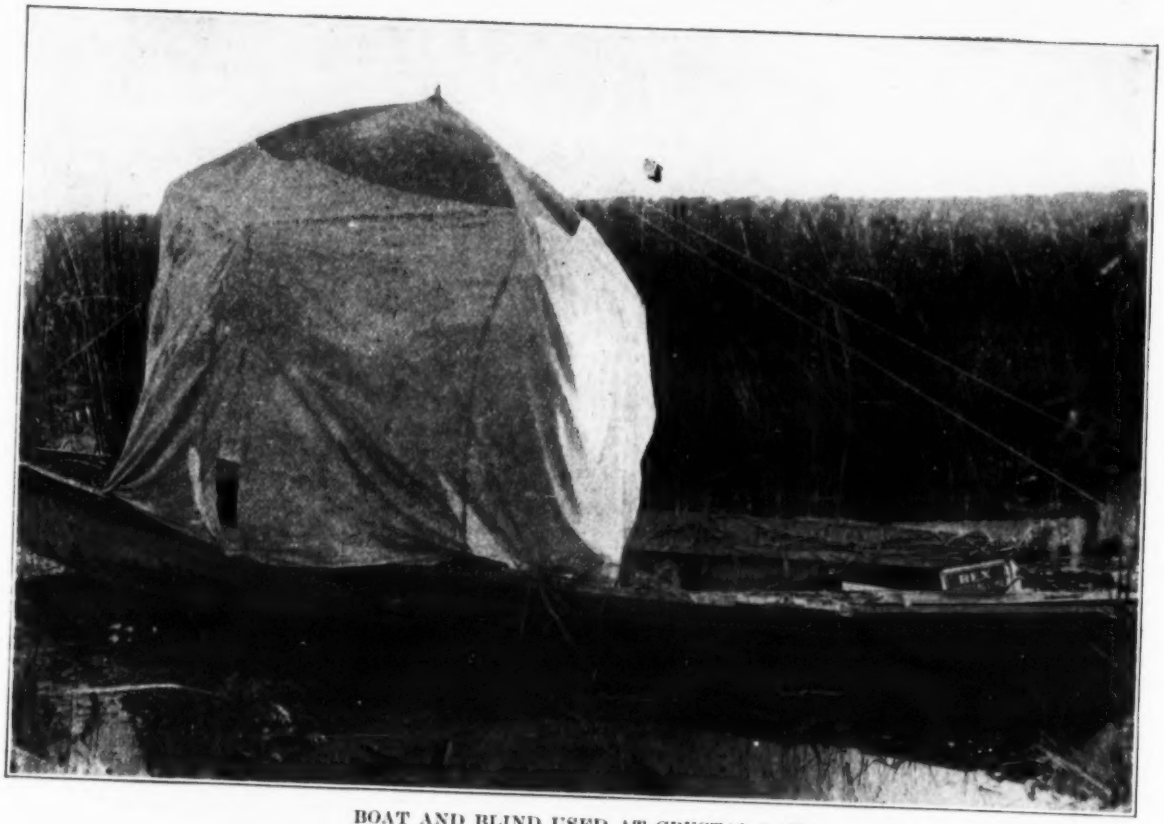

BOAT AND BLIND USED AT CRYSTAL LAKE

THE
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TEN DAYS' BIRD STUDY IN A NEBRASKA SWAMP.

An Account of the Feeding Habits of the Bitterns and Swamp Blackbirds.

By Ira N. Gabrielson.

On the Nebraska side of the Missouri River, just across from Sioux City, Iowa, lies Crystal Lake, one of the typical ox-bow lakes formed by that stream. Between the north end of the lake and the river much of the territory is low and swampy and, in times of flood, covered with water. Just west of the town of South Sioux City there remains a large swamp almost entirely filled with wild rice, cat-tails and bulrushes. Open water is found in only one or two places. Along the eastern edge of the swamp is a sparse growth of willows and a little further back an occasional patch of wolf-berry and other bushes. On the south is a tract of timber, mostly of such trees as box elder, willow, and cottonwood, covering several acres. Scattered here and there throughout the tract are patches of tangled vines and shrubs of various species. In this region are found certain swamp loving birds in abundance.

In late June and early July of 1913, Mr. Howard Graham

and the writer spent ten days studying the birds of the swamp. We were unable to put in the entire time at the work but spent the greater part of each day there. A boat was secured, and an umbrella blind was erected on it. The boat proved to be leaky and we spent some time each day in bailing. Of course this interfered with the work to some extent. The worst trouble was with the wind, which blew so violently during each afternoon that we were unable to see anything from the blind. The heat at times became almost unbearable on account of the excess moisture in the air.

We started investigations on June 26 when we explored the eastern and southern sides of the swamp, but did not cover the northern or western parts on account of lack of time. On all sides of us we could hear cries of young birds and old. Black terns circled over our heads screaming and sailing directly at our faces only to turn aside just before reaching us. We found nests of several species and a number of those of the Yellow-headed Blackbird, the one we particularly wished to study. On the twenty-eighth we returned to the swamp, placed the blind on the boat and anchored it securely between the nests of a Bittern and a Yellow-headed Blackbird. From this time one of us was at the swamp most of the time until July 7 when we finally left.

We wished to study as many of the common nesting species as possible and succeeded in getting more or less data on the Bittern, Least Bittern, and Yellow-headed and Red-winged Blackbirds. The cramped position necessary in the blind compelled frequent relief, and during the periods of freedom from the blind we searched the swamp or timber for nests. During the time of the study we noted the following species of birds in the swamp or in the timber and bushes around the edge. The list could have been somewhat extended by a more careful search of the timber, as in past years a number of species have been noted breeding which were not noted during the study. Almost all of the species noted in the present report have been found nesting there at some time or other although not necessarily in the time of the work. Their presence is however good indication that they were nesting

again. Lack of time prevented a thorough search for nests. The following list of species was noted:

1. *Podilymbus podiceps.* Pied-billed Grebe. Abundant resident. Nests with eggs and young of all sizes were found during our stay. Often while we were in the blind a family of young grebes, accompanied by one of the parents, swam almost up to the boat. They seemed to be feeding on aquatic insects and vegetable matter.

2. *Hydrochelidon nigra surinamensis.* Black Tern. Present in considerable numbers. We found no nests, but thought from their actions they were breeding in the north end of the swamp.

3. *Querquedula discors.* Blue-winged Teal. One or two pairs nesting. We did not find any nests but saw one pair with young while we were in the blind. We could not count the number of the brood, as some of them were concealed by the weeds.

4. *Botaurus lentiginosus.* Bittern. One nest found and studied.

5. *Ixobrychus exilis.* Least Bittern. One pair nested and were watched for one day.

6. *Butorides virescens virescens.* Green Heron. One noted almost daily feeding on the small frogs, which abounded in great numbers. Did not find any nest, but have noted them in other years nesting in the willows along the shore.

7. *Rallus elegans.* King Rail. One individual noted several times.

8. *Porzana carolina.* Sora. Common. Noted every day, but did not find any nests.

9. *Fulica americana.* Coot. Abundant. A large number of nests found, and young of all ages noted. It was seldom during the day that the grating note of this species could not be heard or a number of them seen from the blind.

10. *Oxyechus vociferus.* Killdeer. Not common. One or two could usually be seen feeding along the east shore.

11. *Colinus virginianus virginianus.* Bob-white. Occasionally heard calling from the timber south of the swamp.

12. *Zenaidura macroura carolinensis.* Mourning Dove. Noted daily feeding along the shore and found nesting in the timber on July 1.

13. *Circus hudsonius.* Marsh Hawk. A nest found July 1 in a damp meadow southwest of the swamp. The four young were almost full grown and ran off through the grass as we approached.

14. *Otus asio asio.* Screech Owl. Heard calling from the timber.

15. *Ceryle alcyon.* Kingfisher. One occasionally flew across the swamp to the open water and fished there. The species did not nest about the swamp, but came to it from the Missouri River some distance north.

16. *Dryobates pubescens medianus.* Downy Woodpecker. Noted July 1 in the edge of the timber, where it was probably breeding.

17. *Melanerpes erthrocephalus.* Red-headed Woodpecker. Noted daily along the eastern side of the swamp.

18. *Colaptes auratus luteus.* Northern Flicker. Common.

19. *Tyrannus tyrannus.* Kingbird. One pair nested in the willows on the eastern shore.

20. *Myiochanes virens.* Wood Pewee. One noted in the timber July 1.

21. *Cyanocitta cristata cristata.* Blue Jay. Common in the timber.

22. *Corvus brachyrhynchos brachyrhynchos.* Crow. One or two pairs had evidently nested in the tall trees in the timber. A few came every day and hunted frogs along the shore.

23. *Molothrus ater ater.* Cowbird. Found feeding along the shore. Eggs found in the nests of the Yellow Warbler and Red-winged Blackbird.

24. *Xanthocephalus xanthocephalus.* Yellow-headed Blackbird. Abundant.

25. *Agelaius phoeniceus phoeniceus.* Red-winged Blackbird. A few pairs were nesting along the edge of the swamp.

26. *Sturnella neglecta.* Western Meadowlark. One individual noted almost daily on the eastern side.

27. *Icterus galbula.* Baltimore Oriole. Noted on several different days along the eastern shore in the willows.

28. *Quiscalus quiscula aeneus.* Bronzed Grackle. Appeared daily in varying numbers to feed along the shore. Did not nest in the immediate vicinity of the swamp, but nests commonly in the surrounding territory.

29. *Astragnalinus tristis tristis.* Goldfinch. Common.

30. *Chondestes grammacus grammacus.* Lark Sparrow. Two noted on June 26 as we approached the swamp.

31. *Spizella pusilla pusilla.* Field Sparrow. Breeding commonly in the wolfberry patches.

32. *Pipilo erythrophthalmus erythrophthalmus.* Towhee. One male seen June 26 on the edge of the timber.

33. *Zamelodia ludoviciana.* Rose-breasted Grosbeak. Noted daily about a large cottonwood on the east shore.

34. *Passerina cyanea.* Indigo Bunting. July 26 a nest containing three eggs was found in one of the wolfberry bushes.

35. *Spiza americana.* Dickcissel. Nested commonly in the bushes around the swamp.

36. *Hirundo erythrogastra.* Barn Swallow. Numbers of this species were constantly flying over the water. They nested in some abandoned buildings on the east side.

37. *Vireosylvia olivacea.* Red-eyed Vireo. Noted July 1 in the timber.

38. *Vireosylva gilva gilva.* Warbling vireo. A pair evidently nested in a boxelder in the edge of the timber, as they could be seen there every day.

39. *Dendroica aestiva aestiva.* Yellow Warbler. Nested commonly.

40. *Geothlypis trichas trichas.* Maryland Yellow-throat. Common.

41. *Dumetella carolinensis.* Catbird. Nests found in the timber July 1.

42. *Toxostoma rufum.* Brown Thrasher. Nests found in timber July 1.

43. *Troglodytes aedon parkmani.* Western House Wren. Common.

44. *Telmatodytes palustris iliacus.* Prairie Marsh Wren. Nested commonly.

45. *Penthestes atricapillus atricapillus.* Chickadee. Common in timber.

46. *Planesticus migratorius migratorius.* Robin. Noted commonly feeding along the shore.

The original object of this work was to obtain data on the food of the nestling Yellow-headed Blackbirds. The trip on June 26 revealed many nests in all stages, and the work was started on the twenty-eighth. On that date the blind was fixed on the boat and a search made for a nest with nestlings a day or two old. While engaged in this search we came upon one containing young of about four to six days old. This nest was located about eight or ten feet from a Bittern's nest containing five young. We decided to place the blind between the two and attempt a "double barreled" study. A Least Bittern's nest containing five eggs was marked for future study and the work was completed with a short study of the Red-winged Blackbird. The data obtained from the study of these four species will be presented in the following paragraphs.

YELLOW-HEADED BLACKBIRD. *(Xanthocephalus xanthocephalus).*

The Yellow-headed Blackbirds were by far the most abundant breeding form of the swamp. In the part examined there were probably several hundred nests; in the remaining half of the swamp the number is only a matter of conjecture. The nests which we examined were practically identical in location, being built in the wild rice growing some distance from the shore. They were woven in basket shape about three or more stems from eighteen inches to two and one-half feet above the water. The water in the region of the nests was about hip deep and they seemed to be confined to a belt

of this depth around the part of the swamp studied. This lay quite close to the south and east shores and was, as far as our investigations extended, the deepest part. A belt of water of this depth about one hundred yards wide lay in a half moon shape along these shores while the center was much shallower, being in many places not over eighteen inches deep.

The period of nidification was represented in the colony in nearly all of its stages from nests in which the clutch was not yet completed to almost fully grown fledglings. The cries of the young could be heard on all sides but it was difficult to distinguish one from his surroundings after he was in the weeds. One of the surprises of the study was that of learning the extremely early age at which the young left the nest. In the first brood studied, the young left before the end of the first day's observations. At the time they were in the pin feather stage of development and very few of the feathers had even begun to show beyond the sheath. That these nestlings did not leave any earlier on account of the blind was proved by the finding of a number of others in the same stage sitting on the broken down reeds scattered through the swamp. It seemed to us at first as if the obscurity of the reeds was much safer for the young than the nests, which were at times rather conspicuous, but later developments served to shake our faith in this explanation.

On the morning of June 29 at 4:00 A. M. the blind, erected between the Blackbird and Bittern nests, was entered by Mr. Howard Graham and the writer. Watch was kept on both nests and we soon had proof that the parents had not deserted them. The female Yellow-head fed one of the nestlings at 4:35, or about thirty minutes after the blind was entered. Constant observations were carried on until 4:30 P. M., at which time the wind blew the reeds about so violently that it was impossible to see either nest more than a fraction of the time. The action of the wind also made it difficult to see out of the opening in the blind at all times, so the work was closed for the day. This nest will be called nest A.

July 3 the blind was placed in position at another Yellow-head's nest containing three young. The work was begun at

7:30 A.M. on July 4 and continued until 4:30 P.M., when observations were again stopped by the wind. At the end of the day the blind was taken back to the Bittern's nest to continue the work there. This nest will be referred to as nest B.

In spite of the comparatively small amount of data secured in these two short studies, several facts were noted. In both cases the female did all the feeding, neither male approaching the nest. The males were apparently in little fear of the blind as they sat in the weeds only a few feet from it and uttered the harsh notes characteristic of the species. On several occasions the chosen perch was one of the stakes used to anchor the boat. This of course does not prove that the male never feeds but it is worthy of record that with scores of Yellow-heads of both sexes feeding and foraging about the blind we never saw a male carrying any insects away although many females were often found to do so. The males were seen hunting but always promptly devoured the insects caught. The total number of feedings recorded was thirty-eight for nest A and twenty-five for nest B. Table I will show the character of the food given to the two broods.

TABLE I.

NESTLING FOOD IN NESTS A AND B.

Food.	*Nest A.*	*Nest B.*	*Total.*
Unidentified	*15	1	16
Dragon fly	4	0	4
Larvae	4	0	4
Mayfly	27	19	46
Grasshoppers	0	4	4
Totals	50	24	74

The amount of data here presented is too small to permit of any conclusions concerning the food of the nestlings of the species and yet several important facts are revealed by the study.

*An attempt to continue the observations after the wind became bad explains the large number of unknowns. At nest B the blind was closed as soon as the wind made it impossible to see the nest.

It will be noted that mayflies constituted 62.16 per cent of the total and it is not improbable that most of the sixteen unidentified forms were also mayflies as the blowing about of the reeds prevented our determining the insect fed. This evidence tends to support strongly the statement made in a previous paper* that the food of the nestlings is largely determined by the accident of nest location.

The surroundings of these nests presented no variety. For a considerable distance about the nest, the conditions of shade, moisture, vegetation, and temperature were the same, and the insect species were of course limited to those forms favored by such conditions. As far as we could discover, mayflies and dragon flies were the only forms commonly found. These were clinging to the stems and leaves of the aquatic plants and the blackbirds secured them from these places. They seldom went far from the nest in their hunting and much of the time we could see them climbing about picking up insects until two or three were captured, when they flew to their nests with them.

In the sanitation of the nest the same care was found as in other species, the excreta never being allowed to touch the nest. It was taken directly from the young and carried away. It was rarely devoured, being disposed of in this manner only once in the two days. In nest B the three nestlings received about equal shares, being fed nine, eight, and seven times, respectively. The one which received the greatest number of feedings died in the afternoon and was carried away by the female on the last visit at 3:51 P.M. In nest A the young left the nest during the day and of course no comparison between their food is possible.

The method by which the young left the nest was interesting. At 5:38 A.M. one of the young clambered to the edge of the nest, seized one of the supporting reeds with each foot and climbed up them a short distance above the nest, advancing each foot alternately. After going about eighteen inches, the bending of the stalks under his weight brought

*Nest Life of the Catbird. *Dumetella carolinensis.* By Ira N. Gabrielson. Wilson Bul., Vol. XXV, Dec., 1913.

them in contact with others onto which he went. After traveling in the tops for a little way, he commenced to work toward the water, and reaching a broken reed rested a while. In a few moments he proceeded along this reed to another and was soon out of sight. The second nestling left at 7:00 A. M. in the same manner, and the third started several times but returned and was still sitting on the edge of the nest when the blind was closed for the day.

I had one glimpse of some of the dangers to which the young Yellow-heads are exposed. One of the young from a neighboring nest was sitting on a reed about two inches above the water when the jaws of a hungry pickerel rose from the water and the nestling disappeared. It was done so quickly that if I had not been looking directly at the bird it would never have attracted my attention. It is probable that others meet the same fate. Several times I noted fledglings that had just left the nest fall into the water. They managed to crawl out on a convenient reed but some may lose their lives in this way.

RED-WINGED BLACKBIRD. *(Agelaius phoeniceus phoeniceus).*

During the season of 1913 the Redwings were few in number, only four nests being found in the part of the swamp examined. As a usual thing the nests are placed in the flags or cat-tails, but all of these were in small willows from three to eight feet high, growing just in the edge of the water. No others of this usually abundant species were noted, and apparently the four pair were all that were in the southeastern half of the swamp. In all swamps where I have found both of the marsh blackbirds the same distribution has been noted; i. e., the Yellow-heads occupied the body of the swamp and the Red-wings the edges. As far as my experience goes the former always builds over deep water. The latter, however, is more variable, building along the edge or farther out in the swamp indiscriminately when the Yellow-head is absent, and occasionally nesting in fields quite remote from any water.

At noon on July 3, a small blind was erected at a Red-wing's nest which contained four young. The nest was discovered July 1 and held at that time three young and one egg. At 2:30 P. M. of the third, an attempt was made to begin the study but the birds had not yet become reconciled to the presence of the blind and would not approach at all. At 7:30 A. M. of the fourth, observations began and were continued until 4:30 P. M., when the high wind began to interfere to such an extent as to make further work unprofitable. As we approached, the male greeted us with his "Con-quaree" from the top of the blind, and he continued to use it during the day as a perch, either hopping about the top or swinging on one of the guy ropes. The female did all the feeding throughout the period of observation, the male contenting himself with watching the nest from one of his perches on the blind. At the approach of any person he left his perch and circled about his head, keeping it up until he had passed some distance beyond the nest.

During the day the young were fed fifty-one times. One of the four was dead at the time the work was started but remained in the nest until 3:00 P. M., when the female seized it and carried it away.

TABLE II.

FOOD OF NESTLING RED-WINGED BLACKBIRDS.

Food.	*Number.*
Unidentified	12
Wireworms	11
Cricket	1
Beetle	3
Mayfly	2
Fly	3
Green worms	4
Grasshopper	20
Moth	3
Spider	1
Tomato worms	4
Measuring worm	1
Total	76

The noteworthy thing about these data is the great variety of food used. Apparently the factor of nest location has again been the one which determined the nestling food. The conditions of shade, soil, vegetation, and moisture are varied. The nest was located at the water's edge, and at this point the land sloped rapidly up from the swamp and was covered by a heavy growth of willows and wolfberry bushes. There were at least four readily distinguishable zones in which the conditions mentioned varied: first, the water surface, filled with flags, arrowhead lilies, and, further out, cat-tails and wild rice, furnished mayflies, dragon flies, with an occasional grasshopper; second, the shore line, a zone of from three to five feet in width covered with decaying vegetation and bits of sticks, contained principally beetles and crickets; third, a narrow strip of grass covered territory lying between the shore and the bushes; and fourth, the bushes. The last two zones contained great numbers of insects of various species with grasshoppers the most numerous. These two furnished the greater part of the insects fed and seemed to be the favorite hunting ground of the female. The result of these varying conditions is the use of a variety of species as food instead of practically only two or three as the Yellow-heads did. The Red-wings foraged within a comparatively small area about the nest. The female never became quite reconciled to the presence of the blind and always came to the nest in a quick nervous way and, after inspecting it, fed hurriedly. The young did not raise the posterior end of the body in voiding the excreta and the parent was compelled to probe in the nest for it. Always on leaving the nest the female uttered a call much like that of the cowbird and one that I never before had heard a Red-wing use.

AMERICAN BITTERN *(Botaurus lintiginosus)*.

As far as we could discover there was only this one pair nesting in the swamp. The nest, which was discovered on June 28, contained five young several days old. The nest was built in water about three feet deep in a heavy growth of rushes. It was simply a floating platform of reeds with

no attempt to make a nest depression in the top. It was loosely woven about several upright stems which served to anchor it in place. Leading away from the nest were two distinct paths which ended from twenty to thirty feet away. The parent never flew directly to the nest but dropped into the end of one of these paths and came stalking cautiously to it. In leaving she always followed the other path and took wing from the end of it. The paths were marked by a broken and trampled line of vegetation and ended in a small platform. Our boat was placed directly across the path for leaving, and we had an opportunity to watch the building of a new one. On the first visit noted she walked off through the wild rice to the east of the nest, grasping the upright stalks with her feet and climbing from one to another. Her weight broke numbers of them and made the beginning of the trail. After going about twenty-five feet, she commenced to break other stalks down and lay them in a pile. Some were already in the water and she soon had a platform capable of sustaining her weight. The reeds were seized in the beak and broken with a quick sidewise jerk of the head. When the platform was finished, she stepped upon it and stood there for a time before she flew away.

During the watch on the twenty-ninth we saw her feed only once and then did not get to see the entire process as she entered quietly while we were watching the blackbirds and had nearly finished feeding when we noticed her. We were afraid the young would suffer for food on that day and undertook to feed them. If there was one conspicuous thing about the life in the swamp, it was the frogs—little fellows some of them with the remains of a tail still visible. The shore from three to five feet from the water's edge was simply carpeted with them and a person walking along the shore apparently sent almost the entire surface leaping into the water. It was an easy matter to secure a number with the aid of a stick, and we soon had between fifty and sixty in a couple of cans. When these had all disappeared down the five gaping throats in two feedings, about an hour apart, we thought we understood the necessity for such great numbers

of frogs. As Graham remarked, "It's a good thing there is such a fine crop of frogs and only this one Bittern family around. If the frogs were any less or the Bitterns any more plentiful, there would be a famine in the Bittern tribe."

Only the female came to the nest, although the male was often heard "pumping" in the surrounding reeds. We noted one fact in connection with the Bittern's hunting not noted in any other bird studied, and that was the distance from the nest of the regular hunting grounds. All other birds studied forage in the immediate vicinity of the nest while the Bittern went across the end of the swamp at least a half a mile from it. The nearest shore line and the place where we obtained the frogs was not more than a hundred yards away and the frogs fairly swarmed there. She was never noted feeding along this shore but flew across the swamp to a grass grown point covered with about two inches of water. One day I went around to this point and concealed myself in the willows to watch while Mr. Graham remained in the blind. The Bittern soon came flying from the direction of the nest and dropped into the grass a short distance from me and immediately became stationary. The frogs, which were as thick here as on the other shore, soon forgot her presence and began to swim about or climb over the bogs. When one came within reach, out shot the long neck and beak and seized him. He was hammered against a bog a few times and swallowed. After securing a number in this fashion she stepped up onto a bog and went to sleep. After a short rest she flew a little ways down the shore and went to hunting again. After her hunt and rest this time she flew heavily across the swamp toward the nest. Her disinclination to hunt on the nearer shore probably arose from the fact that it was frequented by boys much of the time and not from any aversion to hunting near the nest.

It was not until July 1 that we secured a good description of the complete feeding process. The following extract is from the note book used on that occasion: "At 9:55 A.M. I heard the flapping of heavy wings and the female settled down into the rushes about twenty feet from the nest. She

consumed ten minutes in covering that distance, advancing a few steps and then remaining motionless for a time. When only four or five feet away, she stopped for five minutes, remaining, as far as I could see, absolutely motionless, and then, apparently satisfied, stepped up to the nest. She progressed by grasping the upright stems of the aquatic plants and when she stopped to listen looked as though she were on stilts. As soon as she reached the nest, the young commenced jumping at her beak, continuing this until one succeeded in seizing it in his beak at right angles to the base. A series of indescribable contortions followed, the head of the female being thrown jerkily in all directions and the muscles of the neck working convulsively. Finally her head and neck were placed flat on the nest for several seconds and then slowly raised again. As it came up the food came slowly up the throat into the mouth. As the food passed along the beak, the open beak of the young bird followed its course along until it slid into its mouth and was quickly swallowed. The young one then released his hold and the parent stood with the muscles of the neck twitching and jerking. The remaining young kept jumping at the beak until one secured a hold on it, when the process was repeated. By 10:30 all five of the brood had been fed. Each one after receiving the food staggered across the nest and lay down with the head and neck flat on the weeds and remained in this position for some time before showing any signs of life again." After the feeding the parent walked away and built the platform described elsewhere. She rested here until 11:15 and then flew away. On the sixth of July the young had become well feathered out although the natal down was still conspicuous on the head and neck. It was impossible to do any more work with them after this time as they began going out in the swamp to meet the parent, receiving the food there and returning to the nest. On July 1 the nest was under observation from 8:00 A.M. until 4:30 P.M. and the young were fed three times during that period, making from five to eight feedings the probable number for the day. Each time all five young were given a mass of food about the size of an

English walnut. In its quick passage from the parent to the young it was not possible to determine much as to its nature except to discern an occasional frog's leg. When last noted they were still being fed by regurgitation. It would be interesting to know how long this method of feeding is continued but we were unable to follow the fortunes of this Bittern family any further.

An observation made in 1910 may be of some interest in this connection. While a piece of wild hay was being cut, a nest of this species was uncovered and four of the five young were killed before the team could be stopped. A small patch of hay was left standing about the nest and the young one placed in it. At this time he was fully feathered out but was unable to fly. The next day the parent was noted flying into the patch of hay without anything in her beak. After she left I walked over and approached the young one, who immediately started to run. Seeing that he could not escape he stopped and disgorged the contents of his stomach. An examination showed one garter snake about sixteen inches long, a meadow mouse and three crayfish, all partially digested. This observation seemed to prove that at this age the young were still being fed by regurgitation.

During the time the nest was under observation, a number of interesting facts were noted in connection with behavior. One thing which struck us very forcibly was the apparent readiness of the parent to abandon the young at the approach of any person. She made no attempt to defend them but stalked stealthily away at any slight noise or movement. This made it necessary to sit absolutely motionless in the boat while she was at the nest and as she frequently remained for an hour or more it became decidedly uncomfortable. Any slight movement would cause the boat to tip and at this she was gone in a flash. Several times she approached to within a few feet of the nest and was frightened away by some slight motion of the blind. On these occasions she generally remained away for from three to four hours. This is not always true of the Bitterns as I have had them remain on the nest and almost allow me to touch them and have had

them try to frighten me away by ruffling up the feathers and making a funny hissing sound.

The actions of the young were very interesting and were in direct contrast in many ways to all other young birds with which we were familiar. No sound was ever made on the approach of the parent beyond a slight hissing, barely audible in the blind four feet away. This was very different from the young Yellow-headed Blackbirds on all sides of them, who could be heard almost constantly begging for food. During the absence of the parents, however prolonged, no outcry was ever made by the young Bitterns unless one of us went out of the blind and tried to touch one of them. When we did this they backed away from us, uttering a curious hissing sound and pecking viciously at our fingers. It was interesting to note the change in their actions after the parent left the nest. For perhaps ten minutes they remained in the position assumed after feeding, as described above. At the end of that time they commenced to raise their heads and look around. For the next hour they sat contentedly on the shaded side of the nest, occasionally dipping the tip of the beak into the water but never drinking anything. In the next half hour they began to grow uneasy and to keep watch for the parent. Every blackbird that flew above the nest caused each head to rise to its full height and silently watch his flight across their horizon. At times they seized each others' beaks in the same manner as the parent's was held. At other times they seized the reed stems crosswise and pulled vigorously on them, sometimes working the mandibles as if chewing. This continued until the return of the parent, when all would assemble on one side of the nest and watch her approach through the reeds. No sanitary measures were noted, and the nest became a rather unpleasant smelling place before our work was finished.

LEAST BITTERN. *(Ixobrychus exilis.)*

The Least Bittern nest, which was located on June 26, contained five eggs. On July 4 two eggs had hatched and on the sixth all but one. The blind was put in place on the

evening of the sixth, and we watched this nest most of the day on the seventh. In marked contrast to the timidity of the Bittern, these birds were devoid of fear. While we hauled the boat and blind in place and drove stakes to anchor it, the female sat quietly on the nest. And when we removed the blind, the male gave an exhibition of equal fearlessness by sitting on the nest through it all and pecking angrily at our fingers when we tried to touch him. On July 7 at 8:00 A. M. I entered the blind. The female was on the nest and did not leave until I stepped into the boat, causing the blind to tip suddenly toward her. At this she stepped off from the nest and walked some five or six steps. After remaining there watching the blind for about thirty minutes she returned. The nest was a small platform built in the rushes and back of it was a mass of broken down vegetation which formed a platform several feet square. This the Bitterns used as a landing place. The fifth egg had hatched and the shell was gone when I entered the blind, although the nestling was not yet dry. One or the other of the parents kept the nest covered throughout the day and both assumed the same position. They sat on the nest with the wings spread in such a manner as to give the body a curious flattened appearance while the head and neck were extended to their full length with the beak pointing straight in the air. Occasionally the head was lowered for an instant to examine the young but almost immediately was raised again. Every bird that flew by was watched and every movement in the surrounding vegetation seemed to be noted by the bird on the nest. This position had the advantage of elevating the eyes some distance above the nest and gave the bird a better view of what was going on around.

I was curious to see how these newly hatched young would get their food; to see if they were fed as the young American Bitterns had been. At 10:50 the bright colored little male alighted on the platform behind the nest and stood there watching the female who was on the nest. From time to time he allowed the beak to hang open and shook his head in a comical way. After he had been doing this for ten

minutes, the female stepped from the nest and flew away. The male took her place and stood, still shaking his head. All of the brood, *including the one just hatched,* were jumping at his beak. Finally one of them succeeded in securing a hold on it and pulled his head down toward the nest. His beak was seized at right angles by that of the young as in the case of the American Bittern. Instead of the violent contortions which preceded the act of regurgitation in the other species, a few convulsive jerks of the throat and neck muscles brought the food into the mouth, from which it passed into that of the young in the same manner as before. The food instead of being in a compact mass was more of a liquid containing pieces of small frogs and occasionally whole ones. These nestlings had not yet become proficient in their strange manner of feeding and more or less of the food material fell into the nest. When this happened, the young which were not receiving food at the time seized it and swallowed it. When two secured a hold on the same frog, an exciting tug of war followed until one or the other was victorious. All five young were fed at each visit, and it seemed to be as instinctive for them to jump at the beak of the parent as it is for other young birds to raise the opened beak.

During the day the male and female alternated in the care of the nest but the brooding periods of the latter were much the longer. She seldom remained away any length of time. On the other hand the male did all the feeding, four times, during the day. The female evidently hunted only for her own food during her absences from the nest while the male foraged for both the nestlings and himself. Both parents did their hunting on an extensive mud flat about two hundred yards from the nest.

No attempt was made at sanitation during our brief study, the excreta being allowed to drop on the nest or fall into the water beneath. The unconcern of the parents at our presence made them the most interesting of all the birds studied and it was with regret that we removed the blind and closed the work.

Marshalltown, Iowa.

BREEDING BIRDS OF A CLAY COUNTY, IOWA, FARM.

By IRA N. GABRIELSON.

The title of this paper is not literally accurate, as the territory included parts of several farms as well as the home place. The notes on which the report is based were made during the summer months in the years 1907-1911 inclusive. The land of the farm and surrounding territory is typical prairie land lying in the eastern edge of the county. It is

NEST AND EGGS OF BLACK TERN

gently rolling and is characterized by innumerable "kettle holes," cat-tail swamps, ponds, and small lakes. Much of it is still unbroken and retains a flora of native grasses and flowers. The only timber in the territory covered by this report consists of the artificial groves—mostly willow, maple, box elder, and cottonwood—a small apple orchard on the home place, and a fringe of low bushy willows along one of the ponds. The remainder of the land is in native grasses, used as hay, or pasture, or under cultivation, usually in corn, oats,

or clover. There were, during the years of study, two ponds of thirty and forty acres respectively, and fifteen small swamps, ranging from one or two square rods to three acres in size, scattered over the region included. This and much of the surrounding land has been drained since 1911, and it is only a question of a short time until the remainder of the swamps and ponds will disappear. A visit during August, 1913, was interesting because of the glimpse obtained of the

NEST AND EGGS OF BITTERN

manner in which bird life had been affected by the change. Only five species of birds, Tree Swallow, Barn Swallow, Bartramian Sandpiper, Killdeer, and Meadowlark, were noted in an entire day in the field where in 1910 or 1911 from forty to fifty species could be noted any August day. Of these five species, the last four were resident and of these only two, the Meadowlark and Barn Swallow, were as numerous as before.

While the list may appear as incomplete, the draining of the country makes it impossible to obtain any further data under the old conditions, and it is deemed advisable to publish it at this time as an approximate list of the nesting species of the region. It might be said that the only species noted in

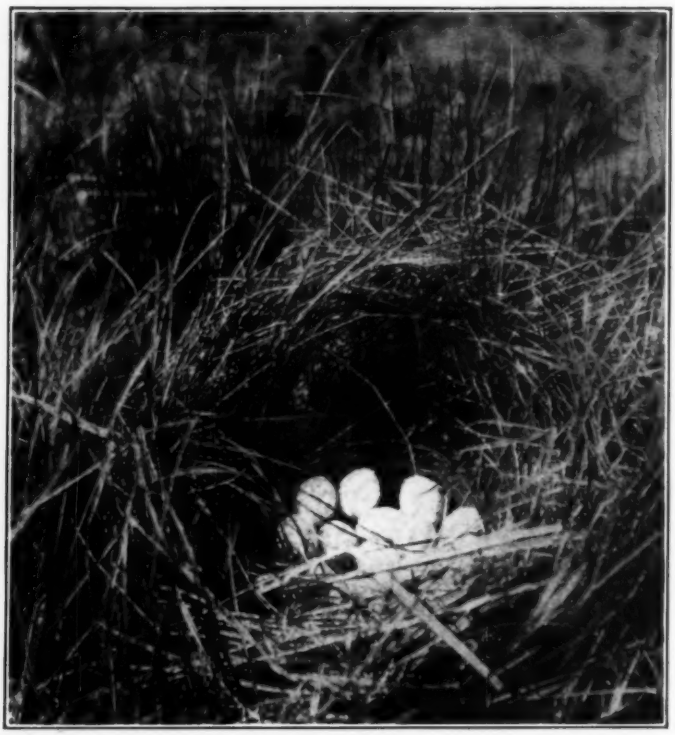
NEST AND EGGS OF LEAST BITTERN

the territory during the breeding season which did not nest there was the Black-crowned Night Heron. These birds visited the ponds daily but nested in the timber along the Little Sioux River some ten miles away.

The species listed here are sharply divided into two distinct groups; viz., those native to the prairie and swamp, and

those which have followed man into the country and nest in the artificial groves and about the buildings.

In the first class may be placed the following twenty-eight species which in all probability were in the country in greater or less numbers previous to its settlement: Pied-billed Grebe, Black Tern, Mallard, Blue-winged Teal, Bittern, Least Bit-



NEST AND EGGS OF KING RAIL

tern, King Rail, Sora Rail, Florida Gallinule, Coot, Wilson's Phalarope, Bartramian Sandpiper, Killdeer, Prairie Chicken, Marsh Hawk, Short-eared Owl, Prairie-horned Lark, Bobolink, Cowbird, Yellow-headed Blackbird, Red-winged Blackbird, Western Meadowlark, Grasshopper Sparrow, Lark Sparrow, Dickcissel, Maryland Yellow-throat, Short-billed Marsh Wren, and Prairie Marsh Wren.

In the second class are included the following twenty-one species which nest only in the artificial groves and about the buildings: Bob-white, Mourning Dove, Screech Owl, Downy Woodpecker, Red-headed Woodpecker, Flicker, Chimney Swift, Phoebe, Blue Jay, Crow, Baltimore Oriole, Bronzed

NEST AND EGGS OF FLORIDA GALLINULE

Grackle, Goldfinch, Purple Martin, Cliff Swallow, Barn Swallow, Yellow Warbler, Catbird, Brown Thrasher, Western House Wren, and Robin.

Of the fifty on the list only the Kingbird is doubtful. This species nests usually in the groves and belongs probably to the second class, but I have found them nesting in the willow

growth along the pond, and they may have nested in situations of that kind before the groves were present. However that may be, it was, at the time these notes were made, one of the most characteristic and abundant birds of the region.

NEST AND EGGS OF UPLAND PLOVER

After the young left the nest, they were to be found along the fences and telephone lines and during August were among the most conspicuous bird forms.

1. *Podilymbus podiceps.* Pied-billed Grebe. Abundant summer resident and breeder. One or two nests found every year in each little swamp.
2. *Hydrochelidon nigra surinamensis.* Black Tern. Breeds com-

monly in small colonies in the swamps. Nest generally built on a deserted muskrat house. In the spring and fall they follow the plows in great flocks, picking up the insects turned up. Picture was taken June 18, 1910. The nest was, as usual, on an old muskrat house.

3. *Anas platyrhynchos.* Mallard. A common migrant, but rather rare breeder. On July 24, 1910, I saw a female and nine partly grown young in one of the small ponds.

4. *Querquedula discors.* Blue-winged Teal. Common breeder. Nests generally found in the long grass bordering the swamps.

5. *Botaurus lentiginosus.* Bittern. One nest containing five eggs was discovered in a hay field on the ground on June 15, 1909. June 13,

NEST AND EGGS OF KILLDEER

1910, I found another nest containing four young within a few feet of the place where the 1909 nest was located. Picture taken June 15, 1909.

6. *Ixobrychus exilis.* Least Bittern. Common about the swamps every year, but only one nest was ever discovered. That was found June 10, 1909. It contained five eggs and was a platform built in the reeds over the water.

7. *Rallus elegans.* King Rail. Common summer resident and breeder. Nests usually built in the thick grass around the small swamps, though they were occasionally placed in the hay fields some distance from the water. A photo of a nest of this species containing 14 eggs was taken June 24, 1907.

8. *Porzana carolina.* Sora Rail. This species was always present in considerable numbers during June and July. While I never succeeded in finding a nest, there is no question of their nesting here, as I noted several times young birds scarcely able to fly.

9. *Gallinula galeata.* Florida Gallinule. Three nests of this species were found: two in 1909 on June 10, and one on June 18, 1910. They seemed to be quite common throughout the region.

10. *Fulica americana.* Coot. Abundant breeder in the ponds and cat-tail swamps.

11. *Steganopus tricolor.* Wilson's Phalarope. I have no definite breeding record for this species, but a pair remained all through June

NEST AND EGGS OF KINGBIRD

and July, 1910. A certain small muddy point projecting out in one of the small ponds seemed to be their particular haunt. At any approach to this place both male and female would appear and circle about the intruder. I thought they had a nest at that point, but although I searched carefully I never succeeded in finding it.

12. *Bartramia longicauda.* Bartramian Sandpiper. Common summer resident. One nest containing four eggs was discovered in a pasture in a bunch of grass. The nest was well concealed and was found with difficulty after it had been visited twice. The photo of this nest was taken June 4, 1909.

13. *Oxeychus vociferus.* Killdeer. Common breeder. Nests generally in the cornfields. The eggs are laid on the ground or on a few pieces

of broken corn husks, with little attempt at nest building. Picture taken June 15, 1910.

14. *Colinus virginianus virginianus.* Bob-white. During 1909 and 1910 a pair of these birds nested in the corner of the orchard.

15. *Tympanchus americanus americanus.* Prairie Chicken. One or more pairs of this species nested every year. Nest built generally along the fences in the tall grass and weeds.

16. *Zenaidura macroura carolinensis.* Mourning Dove. Nests in the groves.

17. *Circus hudsonius.* Marsh Hawk. Nested in the damp wild hay fields. One or two nests discovered and destroyed every year by the farmers.

NEST AND EGGS OF BOBOLINK

18. *Asio flammeus.* Short-eared Owl. Nested in much the same localities as the marsh hawk. The young were very tame and unsuspicious and would allow a close approach as they sat on the hay stacks.

19. *Otus asio asio.* Screech Owl. Nested every year in one of the groves.

20. *Dryobates pubescens medianus.* Downy Woodpecker. Nested in the same grove with the screech owl.

21. *Melanerpes erthrocephalus.* Red-headed Woodpecker. Common summer resident and breeder in the groves.

22. *Colaptes auratus luteus.* Northern Flicker. Not as common as the preceding. One nest found July 3, 1909, containing six eggs.

23. *Chaetura pelagica.* Chimney Swift. Two pairs nested in the chimney to the farm house every year.

24. *Tyrannus tyrannus.* Kingbird. Common breeder. After the young leave the nest they spend their time on the fences and telephone wires. At this season they appear to be the most conspicuous birds of the region. Nests in groves, in the willows along the swamps, on fence posts, and even in machinery left in the fields. June 26, 1910, a nest was found in a large maple tree along the road.

25. *Sayornis phoebe.* Phoebe. One pair nested in 1910 and 1911 under a small wooden culvert in the road in front of the farm.

RED-WINGED BLACKBIRD'S NEST
Containing Two Cowbird's Eggs

26. *Octocoris alpestris praticola.* Prairie Horned Lark. Nests abundantly. Two broods are generally raised. The first nests are built in pastures and the second ones almost invariably in the corn fields at the base of a hill of corn. I have found as many as ten in a thirty-acre field.

27. *Cyanocitta cristata cristata.* Blue Jay. A common bird in the neighboring towns, but not often found in the groves. One or two nests have been found in the region covered by the paper. One nest built in an old apple tree and one in a maple grove.

28. *Corvus brachyrhynchos brachyrhynchos.* Crow. Breeds quite commonly in the larger groves.

29. *Dolichonyx oryzivorus.* Bobolink. One of the most common breeders. Nests commonly in the hay fields. Nests are well concealed in the long grass. One found June 12, 1910, contained four bobolink eggs and two cowbird eggs.

30. *Molothrus ater ater.* Cowbird. Altogether too common. The eggs are most frequently placed in the nests of redwings and bobolinks, although they are sometimes placed in the robin, yellow warbler, and meadowlark nests.

NEST AND EGGS OF GRASSHOPPER SPARROW

31. *Xanthocephalus xanthocephalus.* Yellow-headed Blackbird. Breeds in colonies in the swamps over the water. The nests are basket-like affairs woven in the reeds about two feet from the water. In 1909 many nests were flooded and the young drowned by high water.

32. *Agelaius phoeniceus phoeniceus.* Red-winged Blackbird. Probably the most abundant breeding bird. Generally builds in the cat-tails and flags in the edge of the swamps, but sometimes in the meadows in bunch grass. On June 18, 1910, I found twenty-three nests in a small swamp not over two rods square. The number of nests in the territory

covered by this report ran into the hundreds if not thousands. In 1909 many nests were destroyed by flooding. A nest discovered June 12, 1910, contained three redwing eggs and two cowbirds' eggs.

33. *Sturnella neglecta.* Western Meadowlark. Common breeder. Next to the bobolink the most numerous of the ground-nesting birds.

34. *Icterus galbula.* Baltimore Oriole. One or more pairs nested in the groves each year. I never succeeded in finding an occupied nest, but noted them each year after the fall of the leaves. I also saw the young after leaving the nest.

35. *Quiscalus quiscula aeneus.* Bronzed Grackle. Nests in groves.

36. *Astragalinus tristis tristis.* Goldfinch. One pair nested every year in the orchard.

37. *Ammodramus savannarum australis.* Grasshopper Sparrow. July 14, 1910, I found the only nest of this species discovered in this region. The nest contained two eggs and was in a hay field. It was discovered in mowing, the old bird remaining on the nest until the mower had passed, and then flying off. The nest was abandoned, although every effort was made to leave it undisturbed.

38. *Chondestes grammacus grammacus.* Lark Sparrow. Nests on the dry hillsides.

39. *Spiza americana.* Dickcissel. Nests commonly along the fences and in weeds in the small grain fields.

40. *Progne subis subis.* Purple Martin. Common summer resident in the towns. Several pairs built about the farm building in 1910.

41. *Petrochelidon lunifrons lunifrons.* Cliff Swallow. In 1909 and 1910 a colony of these swallows built under the eaves of the home buildings. Each year there were about half a dozen nests containing eggs and several others in which eggs were not laid.

42. *Hirundo erythrogastra.* Barn Swallow. Common about the buildings. Nests found every year at all the farms of the region.

43. *Dendroica aestiva aestiva.* Yellow Warbler. Several pair built every year in the orchard and in bushes about the house.

44. *Geothlypis trichas trichas.* Maryland Yellowthroat. One pair built in the orchard in 1909. The nest containing three eggs was found June 12 at the foot of a small tree.

45. *Dumetella carolinensis.* Catbird. Builds occasionally in bushes about farm houses. The parents and young leave the groves as soon as the latter are able to fly.

46. *Taxostoma rufum.* Brown Thrasher. Found nesting in 1910 in an old brush pile in one of the groves.

47. *Troglodytes aedon parkamani.* Western House Wren. Common breeder about the farm houses.

48. *Cistothorus stellaris.* Short-billed Marsh Wren. Rather a rare resident and breeder. One nest found July 28, 1910, contained six eggs. The nest was built close to the ground in a damp marshy hay field.

49. *Telmatodytes palustris iliacus.* Prairie Marsh Wren. Nests commonly in the reeds growing in the ends of the larger ponds.

50. *Planesticus migratorius migratorius.* Robin. Common. Builds in the groves and about the houses.

NOTES ON THE SPOTTED SANDPIPER.

By Arthur F. Smith.

During the summer of 1913 the writer was privileged to be present at the session of the Iowa Lakeside Laboratory, on Lake Okoboji, Iowa. There are many opportunities here for the intensive study of the life and behavior of birds, and such work is encouraged by the Laboratory.

In the summer of 1913 two nests of the Spotted Sandpiper (*Actitis macularius*) were found, and at the suggestion of Dr. T. C. Stephens the writer followed their history somewhat carefully. Both of the nests were located similarly, viz., near the extremity of long, low sand spits projecting into the lake for a distance of two hundred yards or more. In each case the nest was about seventy-five feet from the point. The nests, which were located on Gull Point and the Sand Spit in Miller's Bay respectively, may now be considered separately.

The nest on Gull Point was found on Friday, June 27, at 5:30 P.M. At this time it contained four eggs. The ground at this point was sandy, covered by a sparse growth of foxtail grass and a few weeds. The neck of land here was not over thirty or forty feet in width, and was quite low. The nest was afforded very little concealment among the short, dry grass; but, nevertheless, the nest itself is so inconspicuous that it is seen with difficulty even at close range. It was noted that when the parent bird was on the nest her colors harmonized quite perfectly with the surrounding vegetation and ground. The eggs also presented little or no contrast with the environs of the nest.

Visits were made to this nest on June 29, July 1, 5, 7, 8, 10, and 13, and on each occasion one of the parents was

flushed from the nest. At each of these visits the bird, when flushed, flew to some distance; however, when the eggs began to hatch this distance became greatly shortened.

About 7:30 P. M. on the 14th of July the first egg was found to be hatching. The shell was roughly broken across the large end for a distance of about three-fourths of an inch, and from one end of this jagged opening there extended a clean crack pretty nearly to the small end of the egg.

Close examination now revealed that two other eggs were pipped. In both cases there was a little round hole just large enough to permit the protrusion of the tip of the chick's beak. In all three the beak of the chick kept at work crumbling away the edge of the shell and membrane.

The old bird was now very tame, and at no time was she more than a few yards away. She displayed great curiosity, or anxiety, slipping in and out between the grass, and eyed the intruder from one side and then the other.

I then withdrew to a point about twenty feet away in order to allow her to return to the nest. This she did immediately, but something must have frightened her again, for she jumped about four feet straight into the air. I now gradually approached the nest, repeatedly flushing the bird and waiting for her return; when I got within five feet of the nest the old bird left, only to return at once, calling and receiving answering chirps from the partly hatched young. Finally, I got within three feet of the nest; the old bird simply stood up on the piece of bark by the nest, looked interested, and returned to the nest.

The old bird covered the nest by spreading the wings slightly, and fluffing the breast feathers.

As I crept a little closer the old bird flushed, and I saw that the first young bird had emerged from the shell. At 8:30 P. M. I left. The nest contained at this time one chick, two pipped eggs, one entire, and one empty shell.

July 15. When I returned to the nest at 4:30 A. M. the old bird was on the nest, but flushed at my approach. The nest now contained four young birds and three empty shells. Evidently one shell had been disposed of, and probably the

night before. One of the chicks left the nest with vigorous chirps, and joined the mother near by. One other chick, though not yet dry, was endeavoring also to leave the nest.

As I lay within two and a half feet of the nest, the old bird came and pecked at an egg shell, and then sat down. Two of the chicks climbed onto the mother's back.

I was able to distinguish two calls of the adult birds. One might be called the *alarm note,* which gives warning to the young of danger; it is simply a repetition of a single note, thus: "Peet-peet-peet-peet," etc. The other might be called a song, for the parent sings it as she coddles the young. It runs thus: "Tr-tr-tr weet, tr-tr-tr weet, tweet, tweet, tweet, tr-tr-tr."

One of the first acts of the old bird was to pick up one of the half shells and carry it to the water's edge, where it was dropped. A little later she bit off some pieces from the small part of the shell and swallowed them. At 5:30 A.M. she carried off the second half shell and dropped it at the lake shore as before. At 6:00 A.M. she cleaned out the nest, eating a number of small bits of shell, some of which she obtained by scatching in the grass; the last large piece of shell was carried to the shore as before, but this time she held it under the water and shook it. The shell was then eaten, thus departing somewhat from the previous conduct.

At 6:10 A.M., when the old bird returned, two of the young were about twenty feet away in the grass. Up to this time a close watch had been kept as to the feeding of the young birds. The parent was not observed to bring any food to the nest. But now the two little chicks which had left the nest were observed to pick at the grass as if in the act of catching insects. And with continued observation I concluded they were feeding, all of which the old bird watched attentively. On one occasion a garter snake came to the vicinity of the nest, but was warded away from the direction of the young birds by the vigorous wing action of the parent.

On the 17th the place was again visited for the purpose of photographing the young. Two were found and photographed; the other two were seen to run off in the grass, but

were not caught. The old bird seemed to divide her attention between these two pairs of chicks.

Some summer cottagers living near by said they had been in the habit of feeding these sandpipers (what I do not know), and they stated that the chicks usually appeared in pairs. Just why the chicks should leave the nest in pairs

NEST AND EGGS OF SPOTTED SANDPIPER

I am not at present able to say, except that a suggestion is found in the study of the next nest.

The nest on the Sandspit in Miller's Bay was found on June 27, and contained four eggs. It was visited daily and on the evening of July 12 the four eggs were intact. At 1:30 P.M. on the 13th there were two chicks and two eggs. At 3:20 P.M. the third egg was pipped, with the chick's bill protruding. At this time the two chicks were running about in the grass. It was interesting to observe that at this early

age, only a few hours out of the shell, the young exhibited the peculiar habit of teetering the tail, which is characteristic of the adult, and which gains for them the common names, "Tip-up," and "Teeter-tail."

At 5:00 P. M. there was no change in the third egg, but the fourth was cracked at the large end. At 8:30 P. M. the third egg had not changed, but the fourth egg presented a small

NEST AND EGGS OF SPOTTED SANDPIPER

hole about three-eighths of an inch from the large end. At 9:30 P. M. there was no further change in either egg.

At 5:00 o'clock on the morning of the 14th the last two eggs had hatched, and there were three chicks in the nest, together with the two shells. These shells were complete except for a cap about five-eighths of an inch in diameter at the large end. The cap, which lay in the nest, was very cleanly cut from the rest of the shell.

At 9:00 A. M. the nest was empty.

At some time about the middle of July some members of the Laboratory brought in two of the chicks from Gull Point. They should have been returned to that place, but, instead, were liberated on the Sandspit. However, on July 24, five of the six young sandpipers which were now on the Sandspit were banded by Dr. Stephens and Dr. Lynds Jones. As a matter of interest and record the numbers of the bands may be here given as follows: 11522, 11523, 11524, 11525, 11526. The young birds were observed on the spit as late as July 29. It is hoped to continue the study of these birds during the summer of 1914.

The facts obtained in this study may be summarized as follows:

SUMMARY.

The incubation period would seem to be over seventeen days.

The old birds dispose of the egg shells partly by devouring.

Hatching seems to occur during the night.

The chicks leave the nest within five or six hours, but probably not much sooner unless disturbed.

It seems that the young birds are not fed by the parents at any time, but forage for themselves from the beginning.

THE RESIDENT BIRD LIFE OF THE BIG CYPRESS SWAMP REGION.

By F. M. PHELPS.

In the spring of 1913 I had the good fortune to be in Florida during the months of March and April and the early part of May. Of this time the latter half of March and nearly all of April were spent in the Big Cypress Swamp region of Lee County in the southwestern part of the State, and it is relative to its resident bird life that this paper has to deal, giving particular attention to the larger and more important species.

For a week before entering upon this trip I visited at Clearwater with my good friend, Oscar E. Baynard, going over details and arrangements. I must thank him largely for such measure of good fortune as came to me later, for he gave me the benefit of the knowledge he had gained of the country during the two previous winters, and also secured for me the services of guides whom he had employed.

I arrived at Fort Myers March 13th, where I met Mr. Rhett Green, now employed as warden by the National Association of Audubon Societies, who was to conduct me to the rookery under his charge. We started out just before noon of the 14th in a light, single buggy and drove the rest of the day through the open, sun-lit pine woods without particular incident, and camped that night in a temperature that made even the lightest covering a burden and stirred the mosquitoes to the highest pitches of fervor.

By sun-up we were on the way again. The country was now growing wilder. The dog started a Wild Turkey from a clump of saw palmetto beside the trail, a Sandhill Crane swung trumpeting across a near-by pond. Twice we stopped while I slipped on my climbing irons and ran up to nests of the Florida Red-shouldered Hawk, each time to find two eggs apparently advanced in incubation. The ground was becoming low and wet and cypress "heads" more and more frequent. Toward noon we came out upon the edge of a big open marsh stretching away four or five miles to the south, far across which we could see a solid background of great cypress trees. This was my first view of the Big Cypress Swamp, which beginning here runs almost unbroken for sixty or seventy miles to the south and to the eastward until it finally merges with the Everglades.

As we progressed slowly across the marsh, often hub deep in water, singly and by flocks water birds began rising on every hand; Ward Herons, Egrets, White and Wood Ibis, Yellow-crowned Night Herons, Little Blue and Louisiana Herons, and several species of Ducks, including three of the rare Florida Duck (*Anas fulvigula fulvigula*). On an open pond we also identified the Limpkin and Purple Gallinule.

Early in the afternoon we arrived at Mr. Green's camp beside one of the finest rookeries to be found in Florida, an imposing one even in these days of diminishing bird life. Here is no doubt the largest nesting colony of Wood Ibis in the State, probably not less than 5,000 pairs of birds. Perhaps 300 American Egrets were nesting here, and a little handful, not more than a dozen pairs, of the beautiful

WHITE IBIS AT NEST
Photo by O. E. Baynard

Roseate Spoonbill, which I saw here for the first time in life, a memory that still recurs to me. That evening as we stood watching the birds filing in from the feeding grounds and circling over the rookery, I caught a gleam of pink as one of the more distant birds turned in the rays of the setting sun, and leveling my glass I watched my first "Pink Curlew" circle slowly two or three times above the tree tops and then drop down to its nest.

Next morning as the first light of dawn tinged the eastern sky a pair of Sandhill Cranes began whooping on a little pond scarcely a quarter of a mile away, an old Turkey Gobbler struck up his mating call down the open glade that lay between us and the cypress swamp, the thousands of young Wood Ibis and other nestlings set up their insistent clamor for food, which did not hush nor diminish until the sun was high in the heavens, and then I realized that here

NEST AND EGGS OF WHITE IBIS
Photo by O. E. Baynard

was nature at first hand and that opportunities awaited me that do not come to every ornithologist.

I passed several very pleasant and profitable days with Green, and perhaps a few words in description of this splendid rookery, known as the Corkscrew among the plume hunters of South Florida, will not be amiss. In form it is a great ellipse of cypress swamp enclosing an open treeless area some three miles long and a mile or more in width, covered with saw grass and other swamp grasses. The encircling band of cypress varies in width from about one-

third of a mile at the narrow point on the east to two and three miles on the north and west, and to the south it stretches away solidly. Around this great circle birds may be found nesting at many points. Mr. Baynard, who visited this rookery in February, 1912, before the cypress trees had leaved out, gave it as his opinion that there were not less than seven or eight thousand nests of the Wood Ibis here. Tree after tree bore from twelve to twenty or more nests of this species, and in one I counted thirty-two. Years ago before the Egrets and Spoonbills had become so sadly decimated, for they once bred here in large numbers, it must have been a spectacle so imposing as to defy an adequate description. The Egrets, Wood Ibis, and Spoonbills all nest high up in the cypress trees, very few under fifty feet and many seventy-five and eighty feet up. At this season, the middle of March, nearly all the nests contained young. A few of the Wood Ibis and Egrets were still incubating eggs, but these were more than likely birds that had been broken up elsewhere.

Bird studying in a cypress swamp is not all roses, though. It means wading from start to finish, anywhere from knee to waist deep, with a good chance of hitting unexpected depths at any moment. The cypress trees, heavily draped with the Florida long moss, or as it is more commonly known, "Spanish moss," stand close together, vines cross and recross in the openings, impenetrable tangles of button-wood force you to turn aside. Occasionally one comes upon deep, open pools and lagoons covered with lettuce and lily pads, with here and there a half-grown alligator perking up his head. There were big ones in the swamp, too, although I never chanced to see one, but the bellows that emanated forth on a couple of hot nights never came from anything less than eleven or twelve foot 'gators.

Another interesting feature, and one that is not likely to slip your mind for any great length of time, is the dangerous cotton-mouthed moccasin, for he puts in his appearance just about often enough and at just about familiar enough range to keep one on the qui vive. Wading waist deep you come to a nice log and start to climb up onto it. You look again,

a moccasin is within reach of your hand. If he is a small one, he will probably slip off the other side, but if he happens to be four and a half or five feet long and eight or ten inches in girth, he just coils up, opens his white mouth, gently quivers his tail and waits. You will have to kill him or go the other way.

I visited this rookery a second time the middle of April, making the trip across country from Immokalee. Large numbers of the young birds had now left the nests and many were accompanying the old ones to the feeding grounds. In the morning the young Wood Ibis congregated by the hundreds in the cypress saplings at the edge of the swamp just opposite the camp to enjoy the warmth of the early sun. We found one group of Egrets, about fifty pairs, with fresh nests and just beginning the duties of incubation. These were undoubtedly new arrivals, remnants of a shot-out rookery not far away.

To illustrate some of the uncertainties of a cypress swamp. We were three hours reaching this colony of Egrets, located less than a mile within the swamp, although we had visited the same place a month before and presumably knew exactly where it was. The trouble arose from starting in at a slightly different point and encountering a deep lettuce covered lake, in detouring around which we got off our course. By climbing a tree we got a line on the flight of the birds and eventually the croaking of the nestlings drew us to the right spot. In going out we picked up our old trail and were at the edge of the swamp in half an hour.

This rookery has been under the protection of the Audubon Society since 1912. In that year, through the energetic efforts of Mr. Baynard, B. Rhett Green of Fort Myers was hired as warden and assumed the duties of guarding it about the middle of the breeding season. Its future now seems assured, and it is perhaps not too much to anticipate that it will eventually regain something of the prosperity of its former days.

I shall not go into the details or attempt to recount all the various happenings of my trip, for this might finally

become burdensome. During the latter part of March I made an excursion southward from the Corkscrew rookery, following down along the edge of the Big Cypress Swamp to a point some sixty miles below Fort Myers. The first two weeks of April, in company with a guide from Immokalee, I crossed the Ocaloacoochee Slough and penetrated southeasterly to the Seminole Indian reservation at the edge of the Everglades. Then returning to Immokalee, I made a second trip to the Corkscrew rookery from that point.

A few words in regard to the general character of the country. The interior of Lee County is pretty much a wilderness. The Big Cypress Swamp, beginning some thirty miles south of Fort Myers, covers most of the central part of the county. To the north and east of the swamp it is principally open pine woods, interspersed here and there with hammocks of oak and palmetto and small cypress swamps, or "cypress heads," as they are usually called. There are several considerable prairie tracts, particularly in the vicinity of Immokalee. In the eastern part of the county there is another large swamp area known as the Ocaloacoochee Slough. In general the country is low and wet with many small lakes and ponds, and after heavy rains water stands everywhere.

Game is fairly abundant. I saw five deer at one time enjoying a noonday siesta in a small grove of pine trees, and in all I probably saw thirty during my trip. Wild Turkey are plentiful and in the wilder country about the cypress swamps wild-cat, bear and panther are to be found.

Immokalee, with a population of fourteen families, located about thirty-two miles southeast of Fort Myers, is the principal settlement, although there are a couple of other smaller ones. Excepting these the only inhabitants are the Seminole Indians and a few cattlemen, who take advantage of the excellent pasture afforded in some places to graze their lean, half-wild cattle. Maps show several forts such as Shackleford and Simon Drum, but these are relics of the old Indian wars, long since fallen into ruin, and their sites can only be determined with difficulty.

The Seminoles, who number about four hundred, live on a

reservation down at the edge of the Everglades about eighty miles southeast of Fort Myers. They are under the control of a government agent, but do little or no work, depending largely on otter and alligator hunting to pick up a few dollars. For several years back the alligator market has been very flat, and they find plume hunting the more lucrative. We camped with an Indian one evening a few miles south of the Ocaloacoochee Slough, who informed me he had shot eight plumes that season, which he had sold at Miami for $8.00 apiece, bringing him in rather a tidy sum. Incidentally I had the pleasure of dining on palmetto cabbage as prepared a la Seminole, and an excellent dish I found it.

The subject would not be complete without a word or two about insect pests. The mosquitoes are without number. As soon as darkness falls they simply arise in swarms. Sleeping without a bar, and a cheesecloth one at that, is out of the question. Even the Seminoles use them. The steady hum of mosquitoes hovering just outside your bar becomes merely a part of life. The horse flies of this region are the last word. In April it is necessary to wrap a horse in burlap when used, and even then they get to them pretty hard. Around camp a horse will stand right up in a smudge all day, and trust to feeding at night. The cattle are forced to bunch together and retire into the cypress swamps during the middle of the day. Even man is not entirely exempt. A couple of times when dining somewhat en dishabille after a wade in the swamp we were forced to hustle out our shoes, etc., for protection.

In the following list of resident species I have aimed to name only those that I actually found breeding or observed under circumstances which made it seem fairly certain they were doing so. The winter of 1912 and 1913 was unusually warm and the spring early, which had its effect on the nesting of many of the species, causing them to begin in some cases several weeks earlier than in ordinary seasons.

1. *Anhinga anhinga.* Water Turkey. Some four or five hundred were breeding at the Corkscrew rookery. On my first trip into the swamp, March 16th, most of the nests contained eggs, but some of the

young had hatched at that date. Many of the nests were 50 and 60 feet up in the cypress trees, but others were found in low bushes beside lagoons.

2. *Anas fulvigula fulvigula.* Florida Duck. Observed feeding on the marshes, but no direct evidence of nesting obtained.

3. *Aix sponsa.* Wood Duck. A common resident in and about the cypress swamps. One nest found April 18th in a Pileated Woodpecker's hole about 30 feet up in a large pine. It contained nine eggs neatly covered with down. Birds not observed about nest.

4. *Ajaja ajaja.* Roseate Spoonbill. This species is right on the danger mark. I doubt if there are more than 50 or 60 birds in the several rookeries in the interior of Lee County. There were not over ten or twelve pairs at Corkscrew, about a similar number at the principal rookery of the Ocaloacooche Slough, and a few are to be found at the other important rookeries. Nesting usually begins in February.

5. *Guara alba.* White Ibis. Observed feeding in considerable numbers on the Corkscrew marsh during March. They nest during April and May, and at Corkscrew they use the elders and button-wood that fringe the inner circle of the swamp.

6. *Mycteria americana.* Wood Ibis. This species forms the bulk of the population at each of the principal rookeries of the Big Cypress region, and its abundance can be readily inferred from my remarks as to the number nesting at the Corkscrew rookery. Nesting usually begins in January and by March 1st the young are as a rule all hatched. The number of eggs is usually three, occasionally four. This bird is a splendid flier and it is a fine sight to watch them filing in from the feeding grounds, floating high in the air on motionless pinions like great kites, for in their power of flight they are comparable to the raptores rather than to the heron tribe.

7. *Ardea herodias wardi.* Ward's Heron. Fifty or sixty pairs were nesting in the Corkscrew rookery, as a rule in company with the Egrets. Their huge nests are fully twice as large as those of the latter. They are early breeders, usually beginning family duties in January. Also observed nesting in company with Little Blue and Louisiana Herons in willow bushes in ponds.

8. *Herodias egretta.* Egret. The Long White has succeeded in maintaining itself in the face of constant and relentless persecution, for here it has the Seminole Indian as well as the white plume hunter as an enemy. Annually in February the birds gather at the old accustomed rookeries, build their nests and perhaps lay their eggs, and then the plume hunter appears. Each is so anxious to beat the other to it that they scarcely give the birds a chance to get a few sticks piled together, as my guide put it. A few birds are killed, not many, as the birds are wary until the eggs are advanced in incubation or the young hatched. Then they desert the rookery and try it somewhere else, with more than likely the same result. A cattleman told me of coming onto a small

colony nesting in a little cypress swamp late in June, 1912, every plume shed, but incubating eggs. There is still a sufficient nucleus of these birds left in the Big Cypress region, so that the species will build up rapidly if given proper protection.

9. *Egretta candidissima candidissima.* Snowy Egret. Now but a memory in this region. I have asked hunters and the settlers at Immokalee about this bird and the answer is always the same: "About eight or ten years ago I saw one at such and such a place." This Egret is still to be found, however, in the coast rookeries of Lee County and on the Caloosahatchie River near the Everglades.

10. *Hydranassa tricolor ruficollis.* Louisiana Heron. Abundant. Observed nesting in company with Little Blue Herons in clumps of willows in ponds during early April.

11. *Florida caerulea.* Little Blue Heron. Always associated with the Louisiana Heron and remarks about one are equally applicable to the other. Large numbers of immature birds in the white plumage were observed on the feeding grounds.

12. *Butorides virescens virescens.* Green Heron. Not very common. Observed only now and then and not found nesting.

13. *Nycticorax nycticorax naevius.* Black-crowned Night Heron. Observed several times, and it is no doubt a breeding species, although I did not find it nesting.

14. *Nyctanassa violacea.* Yellow-crowned Night Heron. Quite a number nested at the Corkscrew rookery and we used often to come upon them feeding beside quiet pools and lagoons.

15. *Grus mexicana.* Sandhill Crane. Still to be rated as a common bird in Lee County. I hardly believe there was a day of my trip that I failed to see or hear it. They were usually in pairs, though a number of times I saw four or five together. The nesting of this bird is very uncertain. It may begin in late February or it may be deferred to April or May. Mr. Green told me of finding a nest early in June, 1912, with fresh eggs. I am inclined to think the amount of water in the nesting ponds is an important factor. The bird seems to require that its nesting site be surrounded by water. Twice after heavy rains I found them scratching up nests in grassy ponds which they abandoned without using when the ponds began to dry up. Three occupied nests were found, on April 4th and 8th, with eggs far advanced in incubation, and on April 12th with fresh eggs. In this latter case the birds had scratched up no less than four nests in a small flag pond I could throw a stone across. Why the extra nests, two of which were only about half complete, is a question.

16. *Aramus vociferus.* Limpkin. Observed twice in the cypress swamp at Corkscrew, and also feeding on a small lake on the marsh. Presumably there was a small nesting colony in the vicinity.

17. *Ionornis martinicus.* Purple Gallinule. Observed several times on small lakes feeding among the bonnets.

18. *Gallinula galeata.* Florida Gallinule. Identified twice on a small lake on the Corkscrew marsh.

19. *Colinus virginianus floridanus.* Florida Bob-white. Abundant about Immokalee and through the higher and more open pine woods. Nesting in late March and early April. I was told of a nest with 13 eggs being found at Immokalee the last week of March.

20. *Meleagris gallopavo osceola.* Florida Turkey. A common resident throughout the interior of Lee County and should remain so for years to come. I saw many, thanks largely to the dogs that were nearly always along. Late on the afternoon of April 18th as we were working along an open glade bordering a cypress swamp the dog began to nose excitedly in the grass. Suddenly up popped half a dozen little brown cannon-balls, quail I thought, but when they alighted in some cypress saplings I saw at once they were young Turkeys. The old hen, hard pressed, soon rose from the grass and sailed away across the tops of the cypress trees. More youngsters kept popping up until there were eleven sitting about in the saplings some twelve or fifteen feet up. Soon one gave a peculiar little "quit," and then to my utter astonishment flew straight away over the tops of the cypress trees after the old hen, and one by one the rest followed. My guide pronounced them to be about two weeks old and that seemed to me about correct. A few days later the dog ran onto another old hen with young but a few hours old, and we had some trouble in keeping them from coming to harm. The early spring of 1913 caused some of the Turkeys to begin nesting the forepart of March. In ordinary years deposition of eggs does not begin much before April 1st.

21. *Zenaidura macroura carolinensis.* Mourning Dove. Observed occasionally in the pine woods. Not common.

22. *Chaemepelia passerina terrestris.* Ground Dove. Common about Immokalee, and seen occasionally in the pine woods. One nest found April 4th with two fresh eggs.

23. *Cathartes aura septentrionalis.* Turkey Vulture. Present in considerable numbers during the breeding season, but no evidence of nesting found, and it may be that it does not so far south in Florida.

24. *Catharista urubu.* Black Vulture. Abundant. I found no nests, but saw them mating several times. They are a nuisance hanging around a camp, as it is necessary to keep things pretty well covered to be safe.

25. *Elanoides forficatus.* Swallow-tailed Kite. I spent much time looking for the breeding haunts of this species, which is still to be found in certain of the wilder parts of Florida, and was rewarded by finding it nesting at two widely separated points, one far down on the edge of the Big Cypress Swamp, the other near the Ocaloacoochee Slough. It is a bird to be associated with cypress swamps. It loves the broad, open glades that fringe them, and here of a late afternoon you may chance to see them feeding. Gracefully and tirelessly they circle back and forth, chattering as they pass close to one another, and perhaps if the

mood is on them they will take a turn at somersaulting and other startling aerial stunts. They show very little fear of man at such times, for more than once as I have stood watching them they would swing unconcernedly within 30 or 40 feet of me. The birds are to a certain extent gregarious, for where you find one pair there will likely be two or three more nesting within a radius of half a mile or so. The Kite population of the vicinity can easily be arrived at when you start to climb a nest. The cries of its owners quickly attract the other Kites within hearing distance, and they join in the outcry, though at a safer distance. At each of the nests I climbed from five to eight Kites were circling above me by the time I had gotten well started.

It is an exhilarating experience to sit in the top of one of those tall southern pines, with the breeze swaying you gently back and forth, and watch these matchless fliers sweep and careen above you. Only once did I encounter a really vicious bird. Time and again she swooped down on me, once just brushing my shoulder with her wing. It took all my attention to do the climbing and I never knew just when I was to feel the rush of her wings and hear the sudden boom of their arrested motion right at my ear. It was just a little nerve trying.

Two different times I had the good fortune to watch the birds nest building, and both times the ceremony was much the same. The female, escorted by the male, carried the nesting material. With the most graceful of evolutions, accompanied by a constant chatter, very pleasing to hear, and which reminded me much of the love-making of a pair of Barn Swallows, they flew to a point above the nest. The female dropped down for a moment, arranged the stick or bit of moss in the nest, then rejoining the male away they went chattering as far as one could follow them.

The nests I examined were made of dead cypress twigs and Spanish moss, and were lined abundantly with a soft, silky, green moss plucked from dead cypress trees. In all I found six nests. Two were in the process of construction, the other four contained two eggs each. Five were in pine trees, the sixth in a tall slim cypress. One was at the comparatively low elevation of 55 feet, the highest about 85 feet up and well out on a branch running off at an angle of 45 degrees, the most difficult climb of them all. This last mentioned nest I collected together with the eggs, first crawling out and securing the eggs, then roping up the limb and cutting it off with a hand axe. Nesting dates were March 17th, an unusually early date, perhaps a record, March 28th, April 7th and April 21st. In the latter case the eggs were half incubated. The dates when observed building were April 6th and 7th.

26. *Circus hudsonius.* Marsh Hawk. Observed several times quartering over marshes and ponds during April, and I am inclined to think it nests here.

27. *Buteo borealis borealis.* Red-tailed Hawk. This species is rare in Lee County. One nest found April 5th about 20 miles south of the

Ocaloacoochee Slough. It was about 75 feet up in a big pine. Unfortunately a cattleman, who chanced to take dinner with us near the spot, had shot the female about three weeks previous. Her body lying under the tree was sufficiently preserved to make certain of the identity.

28. *Buteo lineatus alleni.* Florida Red-shouldered Hawk. By far the most abundant of the hawks. Fully 20 nests were seen and no especial effort made to find them. Seven which I examined had either two eggs or two young, not a single one three. The birds nest either in pine or cypress, and where available use large quantities of Spanish moss. Nesting dates: March 15th incubated eggs, April 7th eggs far advanced in incubation, April 3rd half-grown young.

29. *Buteo brachyurus.* Short-tailed Hawk. Rare. Found breeding by Baynard in February, 1912.

30. *Haliæetus leucocephalus leucocephalus.* Bald Eagle. There was one large nest in a pine standing at the edge of the Corkscrew marsh. As breeding begins in November, the young had already left.

31. *Falco sparverius paulus.* Florida Sparrow Hawk. Moderately common resident of the pine woods and hammocks.

32. *Polyborus cheriway.* Audubon's Caracara. Nowhere common. It prefers the more open country and the palmetto hammocks, this tree being its favorite nesting site. I found a nest on April 5th about 50 feet up in a pine, containing two half-grown young. Green reported seeing two young just out of the nest at the edge of a palmetto hammock April 15th.

33. *Pandion haliaëtus carolinensis.* Osprey. There were two occupied nests in the Corkscrew cypress swamp. One was a huge affair planted squarely on the top of a limbless cypress stub, 60 feet up. At both nests the birds were incubating eggs the third week in March and were very noisy as long as we remained in the vicinity.

34. *Strix varia alleni.* Florida Barred Owl. Abundant. Their nightly serenades were one of the most interesting features of camp life. On March 16th, while exploring a little cypress head, I found a young one about 15 feet up in a sapling. He could get about the limbs and work from tree to tree too lively for me and I tried in vain to catch him. During the proceedings the mother came up close, ruffling her plumage and clicking her bill savagely. On the above basis it would seem that nesting begins early in January.

35. *Otus asio floridanus.* Florida Screech Owl. Apparently not very common. Heard two or three times about hammocks.

36. *Bubo virginianus virginianus.* Great Horned Owl. A rare resident. Heard once down on the edge of the Big Cypress Swamp.

37. *Speotyto cunicularia floridana.* Florida Burrowing Owl. This interesting little Owl is nearing extinction. On the prairie near Immokalee I could find only four or five pair nesting where formerly it was abundant. The hand of the cattleman is against it. A couple of bur-

rows excavated April 4th showed the birds just getting ready to nest. One contained one egg.

38. *Campephilus principalis.* Ivory-billed Woodpecker. In Florida this splendid Woodpecker is now confined to the wildest and remotest swamps. Far down in the Big Cypress I had the good fortune to see and hear it, the reward of hours of laborious wading. It is readily distinguishable from the Pileated Woodpecker in flight by the large amount of white on the wings. Its call is quite different, too. There is a distinct pause between the notes and it lacks the carrying power of that of the Pileated. Two nesting sites of former years were seen, both in cypress trees. They may be identified with certainty, as the hole is somewhat oblong in shape, the height being to the width in about the ratio of three to two. The birds also have the peculiar habit of stripping the outer bark from the trunk for a considerable distance below the nest.

39. *Dryobates borealis.* Red-cockaded Woodpecker. Locally distributed in the higher pine woods. Several nesting sites noted. These are cut into living pines with dead hearts, and the trunk for several feet below the nest is thickly smeared with pitch.

40. *Phlœotomus pileatus pileatus.* Pileated Woodpecker. Common and observed almost daily. Three nests were found, all in dead pines, one with three slightly incubated eggs April 5th, a second on the following day with three half-grown young, and the third April 18th, in which the birds were feeding young. One fact that I noted several times is that this bird feeds on the ground after the manner of the Flicker.

41. *Melanerpes erythrocephalus.* Red-headed Woodpecker. Common, but less so than the two following species. Beginning nesting in April.

42. *Centurus carolinus.* Red-bellied Woodpecker. Common and nesting in March. I found one pair appropriating a former nesting cavity of the Red-cockaded Woodpecker.

43. *Colaptes auratus auratus.* Flicker. Common throughout the pine woods. Nests with fresh eggs April 19th and 23rd.

44. *Antrostomus carolinensis.* Chuck-will's-widow. Common in the hammocks, but rare elsewhere. Nesting in April.

45. *Chordeiles virginianus chapmani.* Florida Nighthawk. Observed during early April near Immokalee and it probably nests there.

46. *Tyrannus tyrannus.* Kingbird. A common resident of the pine woods. Saw my first Kingbird March 21st and in a day or two they were plentiful. Observed a pair building April 19th.

47. *Myiarchus crinitus.* Crested Flycatcher. Abundant. The small cypress heads are their favorite haunts and nearly every one harbors a pair or two. They were common everywhere when I first entered the woods March 14th. Nesting begins in April. On the 7th I observed a bird carrying material into a hole in a small cypress tree, and on the 17th I picked up part of an eggshell from the ground.

48. *Cyanocitta cristata florincola.* Florida Blue Jay. A few were observed about hammocks, but not commonly. No nests found.

49. *Corvus brachyrhynchos pascuus.* Florida Crow. Abundant and many nests seen. Eggs far advanced in incubation March 17th.

50. *Corvus ossifragus.* Fish Crow. Found only in the vicinity of rookeries, particularly at Corkscrew, where they do a great deal of damage. Collected a set of five slightly incubated eggs March 28th, the nest being in the bud of a slim pine.

51. *Agelaius phoeniceus floridanus.* Florida Red-wing. Common on the marshes and larger ponds. Nesting in April.

52. *Sturnella magna argutula.* Southern Meadowlark. Abundant in the open pine woods and prairies. Nesting dates: March 25th four fresh eggs, April 4th three incubated eggs.

53. *Quiscalus quiscula aglaeus.* Florida Grackle. We found quite a colony nesting in cavities in the cypress trees at Corkscrew March 20th, and the latter part of April I found another group making use of similar sites in a small cypress head.

54. *Megaquiscalus major major.* Boat-tailed Grackle. Observed nesting in several ponds in early April. Common where it can find suitable haunts.

55. *Ammodramus savannarum floridanus.* Florida Grasshopper Sparrow. Rather common on the prairies. I scratched up a lot of grass looking for their nests when flushed at close range, but was no doubt too early for them.

56. *Pipilo erythrophthalmus alleni.* White-eyed Towhee. Very local and not common. About Immokalee quite a few were seen.

57. *Cardinalis cardinalis floridanus.* Florida Cardinal. Common near Fort Myers and about Immokalee, but almost entirely wanting in the wilder sections.

58. *Progne subis subis.* Purple Martin. In early April half a dozen pair were nesting in woodpecker holes in a couple of dead pines near Immokalee.

59. *Lanius ludovicianus ludovicianus.* Loggerhead Shrike. Observed only in the orange groves at Immokalee.

60. *Vireo griseus maynardi.* Key West Vireo. Not common. Seen only a very few times. One nest found April 10th containing four fresh eggs.

61. *Geothlypis trichas ignota.* Florida Yellow-throat. Noted frequently about the saw palmetto growth in the vicinity of Immokalee. Apparently nesting about the middle of April.

62. *Mimus polyglottos polyglottos.* Mockingbird. Like the Cardinal the Mocker prefers the haunts of man. They were common at Immokalee, but I don't think I ever saw one in the wilder country.

63. *Thryothorus ludovicianus miamensis.* Florida Wren. A common resident. I saw a nest in an old tin coffee can hanging on the side of a shed at Immokalee April 4th. At Green's camp a pair built in the

pocket of an old sweater. I also saw a nest in a natural cavity of a gnarled pine tree at the edge of cypress swamp 20 miles from any human habitation.

64. *Sitta pusilla.* Brown-headed Nuthatch. Moderately common resident of the pine woods. Saw a pair building March 16th, and another pair feeding young April 18th.

65. *Sialia sialis sialis.* Bluebird. Quite common in the pine woods. Observed them about nesting holes several times in April, but examined none.

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EDITORIAL

The editor's address for the summer—until the middle of August—will be Sandusky, Ohio, care Dr. C. B. Bliss. Mail addressed to Oberlin will reach him, but will be delayed somewhat in reforwarding.

The short time between the two issues of the BULLETIN and the examination season have conspired to prevent reviews of literature for this number of the BULLETIN. They will be resumed in the September number.

Interest in studies of the nesting behavior of birds has increased manyfold in the last five years. While July may seem to be rather late for most birds to nest, experience has proven that nests of many of our common birds may be found even into August. Studies of nesting behavior are exceedingly valuable and ought to be taken up more generally over the country before we may hope to get far in our understanding of the inner life of the birds. The intimate study of the Red-winged Blackbird at Ithaca by Mr. A. A. Allen well illustrates what valuable results may be achieved by faithful and long continued studies of this sort, and the papers by Miss Sherman, Mr. Gabrielson and others well illustrate that valuable facts may be discovered by even a one-nest study. Let everybody try at least one nest.

FIELD NOTES

A TWO-STORY YELLOW WARBLER'S NEST.

We have found a yellow warbler's nest with a cowbird's egg in the bottom, over which the warbler had built a second floor on which to lay her own eggs. E. A. FIELDS.

Sioux City, Iowa.

PARTICULAR WRENS.

A pair of wrens had reared a brood in a box on our back porch and were preparing to raise a second brood, when the cover of the box was loosened by the wind and was tied down with a white string. This aroused suspicion on the part of Mrs. Wren, who immediately removed the six eggs and part of the nest. I removed the rest of the nest, but the wrens did not use the box again. What became of the eggs I do not know, as there was no trace of them either in the box or on the porch.

Sioux City, Iowa. E. A. FIELDS.

COWBIRDS MONOPOLIZING A RED-EYED VIREO'S NEST.

In the woods bordering Lake Okoboji, Iowa, in July, 1912, some bird lovers discovered a daintily constructed red-eyed vireo's nest, covered with a pure white, web-like substance, making it the most beautiful nest we had ever seen. Evidently we were not the only ones attracted to it, as it contained four cowbird's eggs and no vireo's eggs. While we examined the nest the vireos, much disturbed, sat on a branch near by. We removed the eggs and returned a week later, hoping to find that the proper owners had used it, but the nest was empty and another vireo's nest was being built near by, presumably by the same birds.

Sioux City, Iowa. E. A. FIELDS.

THE RED PHALAROPE IN IOWA.

Through the kindness of Mr. A. J. Anderson I was permitted to see a specimen of *Phalaropus fulicarius*, which had been shot on a sandbar in the Missouri river below Sioux City. It was presented to Mr. Anderson on November 28, 1912, and had been taken a day or two before. The bird was in the white winter plumage. It was mounted and is now in Mr. Anderson's collection. It seems that this species has never heretofore been reported for either Iowa or Nebraska. T. C. STEPHENS.

FALL RECORD OF THE GOLDEN PLOVER.

On October 15, 1913, my friend, Mr. Fred C. Smith, learned of large flocks of strange birds along the Missouri river bottoms near the villages of Owego and Holly Springs. Word came to the Sioux City sportsmen of the abundance of these birds, and several went down. Mr. William

Anderson shot several and one of these was taken to the Stag Cigar Store, and there identified as a Golden Plover. Mr. Anderson described the birds as having a short bill and a "black back speckled with greenish yellow." Dr. B. H. Bailey, with whom I interviewed Mr. Anderson, was satisfied of the correctness of the identification.

A Dr. Flageau, of Holly Springs, reported that large flocks of these birds, which were locally called "Prairie Pigeons," had been seen in the vicinity for the past ten days "feeding on the winter wheat." Mr. Anderson thought they were feeding on the crickets and grasshoppers rather than the wheat.

A Mr. Williams, of Owego, was also quoted as having seen these birds in large numbers about the same time. Mr. Anderson says he was able to obtain very few birds because of their shyness. When disturbed they would fly up very high in the air, circle around, and finally fly away. T. C. STEPHENS.

SOME WINTER RECORDS FROM MARSHALLTOWN, IOWA.

During the winter of 1913-1914 several records of unusual interest to me were made in this locality.

Red-headed Woodpecker (*Melanerpes erythrocephalus*). In the fall long after the other individuals had left three of this species were to be seen about the cemetery. Every time I passed thru that region I expected to discover that they were gone, but they remained thru the winter. The cemetery contains large numbers of oaks of different species and the Red-heads used the acorns, particularly those of the white oak, for food. These three birds were to be seen at any time either feeding or fighting with the Blue Jays. They had one particular tree which they seemed to use as a sleeping place, and they allowed no Jays to remain in that vicinity.

Red-bellied Woodpecker (*Centurus carolinus*). This species was another form which I was surprised to find here during the winter. I have regarded this as a rather rare bird in this locality, as the only other specimen noted in two years' field work was one taken April 4, 1913. This second specimen remained all winter in the cemetery and is still here at the present writing (May 5). This bird was much more shy than the Red-heads and not so noisy, but we managed to see him on nearly every trip during the winter.

Tufted Titmouse (*Bæolophus bicolor*). On the 25th of January, as I was walking thru a small willow thicket, a small bird flew into a bush not ten feet in front of me. It was snowing hard at the time and this made any observation work difficult. However, I recognized the bird as one of this species and after considerable maneuvering managed to secure him. A short time later another was secured. This is another form which I have considered rare, the only other record being a pair noted on two different dates in April, 1913. IRA N. GABRIELSON.

NESTING OF THE BLUE-WINGED WARBLER IN NORTHERN ILLINOIS.

Apparently the blue-winged warbler is not common in this area even in migrations. However, some few observations made at a time when the presence of the bird argued the likelihood that it had remained to breed in the locality are on record, and Mr. Frank M. Woodruff in "Birds of the Chicago Area" has been led to say, "It does not seem impossible that a very few individuals may remain and breed within our limits."

On May 23 while pushing my way through cover of lesser growth, but comparatively free of underbrush—a rather damp part of the woodland, at its edge and situated between its higher slopes and the creek bottomland—I came upon a nest new to me but quite certainly the nest of a warbler. There were no eggs nor for a time was any bird in evidence. Presently, however, I caught sight of a small yellow head peering out of the greenery. That, I believe, was the male; for my next glimpse was of a bird not so bright but exhibiting some alarm in frequent chippings though for the most part contriving to keep in concealment.

Upon revisiting the nest, May 29, accompanied by Dr. Frederick C. Test, I found it to contain four small, delicately marked eggs, but, as before, the birds were shy and it was only after a considerable interval of waiting that Dr. Test and I were able to descry the female. She kept to the higher branches of the nearby trees, and while manifesting alarm in nervous chipping, seemed indisposed to make the fearless approach common to most of the smaller birds when their nests are threatened.

The nest was placed on the ground and supported by the three stems of a small choke-cherry shrub, to which it was not in any manner attached. It was composed of oak leaves, the stems up-pointed, strips of grape-vine bark and a few coarse grasses. The lining was of long fibres of plant stems, brown in color, and some horse hair.

The record refers to a locality near Fort Sheridan, Lake county, Illinois.

EDWARD R. FORD.

THE FOX SPARROW IN CENTRAL ILLINOIS.

On December 28, 1912, while out on a bird "hunt," my brother and I noticed a bird flying along a hedge before us. At first we thought it was a brown thrasher, but soon we found our error and identified it as a fox sparrow (Passerella iliaca). We soon noticed that it was in some way crippled, and at last we saw that its right wing was not fully developed. It was able to fly short distances easily and avoided capture.

During the winter we saw it again on February 16, 1913, with a companion of the same species, so that our fears for its surviving the winter were allayed. It was easily identified as the same individual we had before seen by its wing. On February 23, 1913, it was again seen

with a companion, as it was again March 16. It was recorded by itself on March 24 and 26, but with a companion on March 30. From that date it was observed with or without a companion (which being so often seen with him, and being somewhat lighter colored, was finally concluded to be his mate) on the following dates: April 1, 6, 8, 9, 10, 19; May 5, 8, 12, 23, 29; June 16, 25; July 12, 24; August 15; September 9 and 21. In October he was observed several times, but with others of his kind, which we gathered, from their actions, were not only of his kind, but of his family. Although no nest could be found, I feel certain that this maimed bird and his mate raised a brood of young fox sparrows in this vicinity. The birds were always found in an abandoned roadway about a half mile from my home. I am also glad to say that our hero's wing seemed to develop during the summer, and though not as strong as the other nor as large, he got along very well and would take long flights without much trouble. GEORGE E. EKBLAW.

Rantoul, Ill.

NOTES FROM HURON, ERIE COUNTY, OHIO.

Found a Black-bellied Plover in an oat field half a mile south of Huron on May 24.

A pair of Prothonotary Warblers have been around Huron for several days prospecting for a nesting place. I had always supposed that these birds were swamp-loving birds, but this pair stay around houses. They were trying to get into wren boxes, and yesterday (May 24) they started building in an empty sprinkling can hung up on the back of a house. They have been around today, but have not done any more building. H. G. MORSE, Huron, Ohio.

TWO NEW BIRDS FOR OBERLIN, OHIO.

Apparently a season of erratic weather conditions is favorable for the appearance of extralimital species. The spring migration of 1914 in northern Ohio will be remembered for the late beginning of the first wave of migration and for the extreme variations from normal of many migration records of first arrival and dates for the arrival of the bulk. The curve of migration was about sixty-five per cent abnormal. The Carolina Chickadee made its first appearance in Oberlin and for the general region on February 27 and remained in the village to April 21. There was a single individual.

Bewick's Wren was taken on April 20. It has been found in the region on three other occasions, but never before in the village.

In this connection it may be worth notice that the Hooded and Prothonotary Warblers were more numerous than ever before.

LYNDS JONES, Oberlin, Ohio.

A CANNIBAL GRACKLE.

The morning of May 30 in crossing the mall to the Smithsonian Institution, I noticed what appeared to be a fight between a Purple Grackle and an English sparrow, and stopped to see the outcome. The Grackle held the sparrow by wing or leg under its feet and pecked savagely at the head. The fluttering sparrow escaped two or three times, but was instantly recaptured. Presently the Grackle began swallowing the grewsome contents of its bill obtained from the still fluttering sparrow. I did not wait to see more, but at noon I sought the spot and found a dead female English sparrow with the back of the head laid bare to the skull. So far as I could see it was not injured elsewhere.

Is the Purple Grackle a bird of prey or was it a fight to the death only, the blackbird swallowing his billsful merely to get rid of them? Was he after a meal or after revenge? As the little corpse was covered with ants when I found it I could not be sure whether the Grackle had eaten the brains or whether the ants had emptied the skull they now filled.

Dept. Agriculture, Washington, D. C. AGNES CHASE.

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